

### A Collaborative Approach to NextGen

## Overview of NextGen Mid-Term Implementation Task Force Recommendations

For JPDO "All Hands" Meeting

October 16, 2009

Margaret Jenny, President, RTCA

# Task Force Volunteer Participation

Group	No. of Volunteers
Total Interested Individuals	359
Work Group Members	284
WWW + Present Equipage Subgroup	55
Evaluation Factors Subgroup	51
Elements Subgroup	88
Business Case Parameters	26
Tutorial-Knowledge Subgroup	26



### Key Characteristics of Task Force

- Short list of ops capabilities, long on details
- "Who," "What," "Where," "When"
- Stress performance-based operating environment
  - Focus on implementing beneficial operational capabilities vs technology
- Backing of operators' financial decision-makers
- Actionable Recommendations
  - Identification of all work required by government and industry to implement a capability
  - Establish firm commitments and implement a follow-up mechanism
- Assessment process
  - Analytic and objective, but balanced with user experience and operational perspective
  - Transparent and repeatable: provides a foundation for revisiting decisions with new data
- Recommendations will aim to provide maximum benefit with minimum risk
  - Acknowledge risks up front, especially for 2015-18 timeframe
    - Builds Mutual Trust and Confidence
    - Documents first sets of actionable commitments
    - Starts community on joint path to implementation

# Target Solutions to Problem Locations

- ...for example,
- Operations at on airport in metro interfere with ops at another
- Delays at one airport cause delays at others hundreds of miles away
- Predicted uncertain weather causes aircraft to be held on ground
- Severe weather causes inefficient routes and delays
- \* ~~~



## Deploy "Capabilities" not Technology

<u>Infrastructure</u> vs. <u>Capability</u>

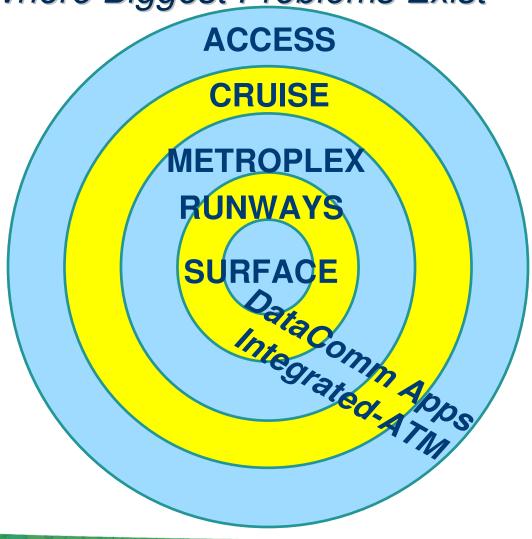
- DataComm Network → Efficient weather reroutes
- ADS-B Infrastructure → Reduced a/c separation
- ADS-B Infrastructure → Efficient Merging & Spacing
- Published RNAV routes→ Efficient routings
- ERAM Release "x" → Controller-Pilot DataComm
- RNP Routes 

  De-conflict NY/NJ Airports

Technology often Necessary, but Never Sufficient to Deliver Benefits

## Getting to NextGen:

Improve Operations Where Biggest Problems Exist



### The Task Force Recommendations

- Operational Capabilities
- 1. Airport Surface
- 2. Runway Access
- 3. Metroplex
- 4. Cruise
- 5. Access
- 6. DataComm Applications
- 7. Integrated ATM

- Critical to Success
- 1. Achieve 3 & 5 nm Separation
- 2. Incentivize Investments
- 3. Streamline Ops Approval
- 4. Post Task Force Collaboration

#### Supporting Data

- 1. Details Who, What, Where, When
- 2. "Elements" Challenges to achieving benefits
  - 3. Dashboard Cost/benefit/risk assessment



# "Elements" \* Challenges to Delivering Benefits

- Change in Roles of Pilot, Controller, Dispatcher
- Technology/Equipage Required
- Technology/Equipage Available
- Decision Support Tools Required
- Policy Changes Needed
- Implementation Bandwidth Issues
- Airspace Changes Required
- Standards Required
- Ops Approval Required
- Certification Required
- Political Risk
- Training Required
- Links to Planning Documents

\* Documented for each operational capability considered



### Surface

### Improve surface traffic management to

- Reduce delays, enhance safety, efficiency & situational awareness
- Capture & disseminate surface operations data to pilots, controllers, ramp towers & FOCs

- Establish one consolidated point of responsibility, authority and accountability within the FAA,
  - ..In accordance with a govt/industry coordinated execution plan

## Runway Access

Increase runway access to converging, intersecting and closely-spaced parallel runways by:

- Leveraging capacity gains achievable through accurate and predictable flight paths,
- Using enhanced surveillance methods.
- Foundational activities based on existing capabilities
- Leading to a determination of needed additional investment.

## Metroplex

Relieve congestion & delays at major metro area airports, inefficiencies at satellite airports, & surrounding airspace by:

- Instituting tiger teams to focus on quality of implementation at each location and de-conflicting of adjacent airports.
- RNAV, with RNP where needed (e.g., for RF)
- Optimized vertical profiles using vertical navigation
- Use 3 NM and terminal separation rules in more airspace
- Integrate approach to airspace design and classification
- ATC, flow and surface traffic management tools.

### Cruise

### Improve efficiency of cruise operations by:

- Increasing the ability to disseminate real-time airspace status and schedules (particularly with respect to Special Activity Airspace)
- Improving flow management to better utilize time-based metering and flight operator capabilities
- Implementing data communications between ATC systems and aircraft to more effectively manage traffic and exchange routing and clearance information.

### Access

Improve access to and services provided at non-OEP airports and to low altitude, non-radar airspace by:

- Implementing more precision-based approaches and departures,
- Expansion of surveillance services to areas not currently under radar surveillance.

# Data Communications Cross-Cutting

- Improve cruise and transition operations by using data communications to enable more efficient use of available or forecast capacity in the NAS.
- Increase the ability to better adapt to changing conditions through improved dissemination of tactical reroutes around weather forecast and congestion.

### Integrated Air Traffic Management Cross-Cutting

- Create an Integrated Air Traffic Management System that leverages new technologies and collaboration with the users
- Implements solutions to traffic flow problems that are effectively integrated across time and air traffic control domains, to achieve the efficiency goals of the service provider and the users.

#### <u>Metroplex</u>

- •CSPO
- Surface Sit Aware
- •RNP
- •CRDA
- Adjacent Airports
- •TFM Data

#### <u>Airports</u>

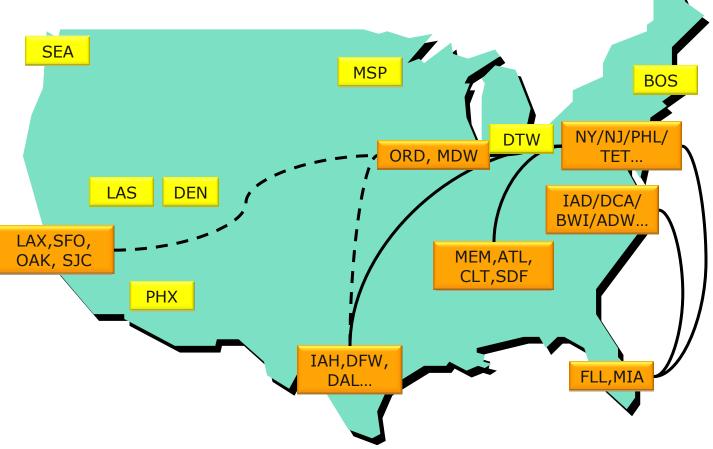
- •CSPO
- •OPD
- Surface Sit Aware
- •RNAV SID/STAR
- •TFM Data

#### En Route/NAS-Wide

- •CPDLC
- •D/C Reroutes
- •Q & T Routes
- •TFM DataComm
- •MMS
- •SAA
- •3-5 Sep
- •TFM

GA Airports
•LPV

# Airport/Metroplex-Centric Approach to NextGen



CSPO – Closely-spaced Parallel Runway Ops OPD – Optimized Profile Descent

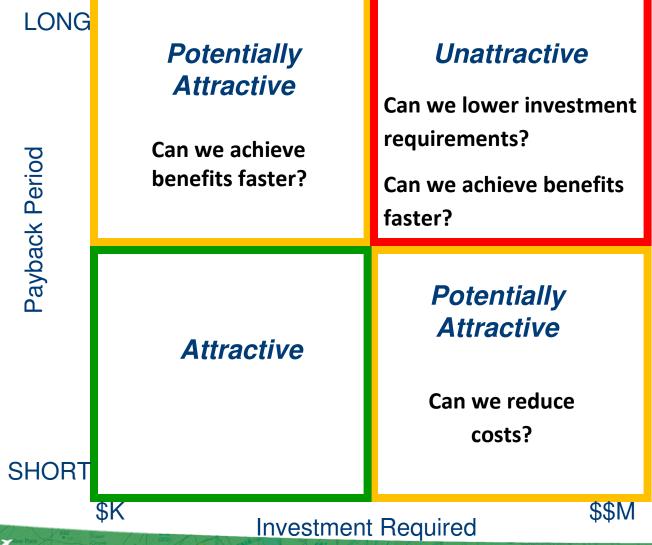


### Overarching Recommendations

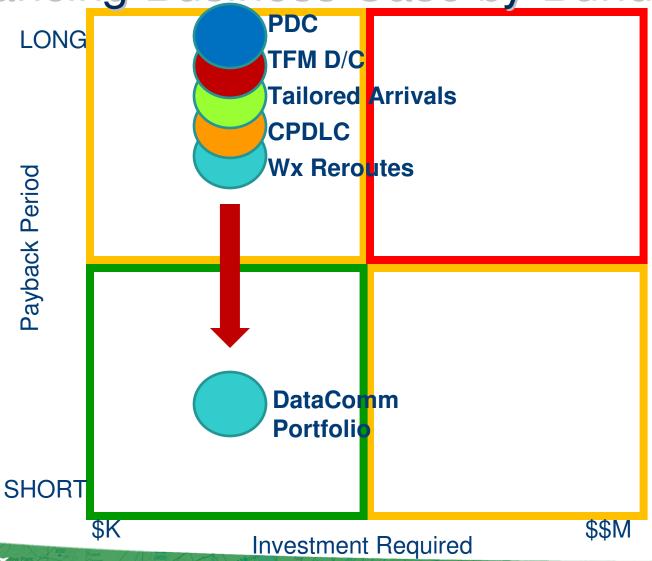
- Achieve 3 & 5 nm Separation Standards
  - Collaborative Change Management, ATSAP, Performance Metrics
- Incentivize Equipage
  - Operational, Financial, Streamlining
- Streamline Operations Approval
- Establish Post Task Force Follow-Up Mechanism
  - Clarification and Disposition
  - Joint Implementation Mechanism
  - Milestone and Performance Tracking



Challenge of Closing the Business Case

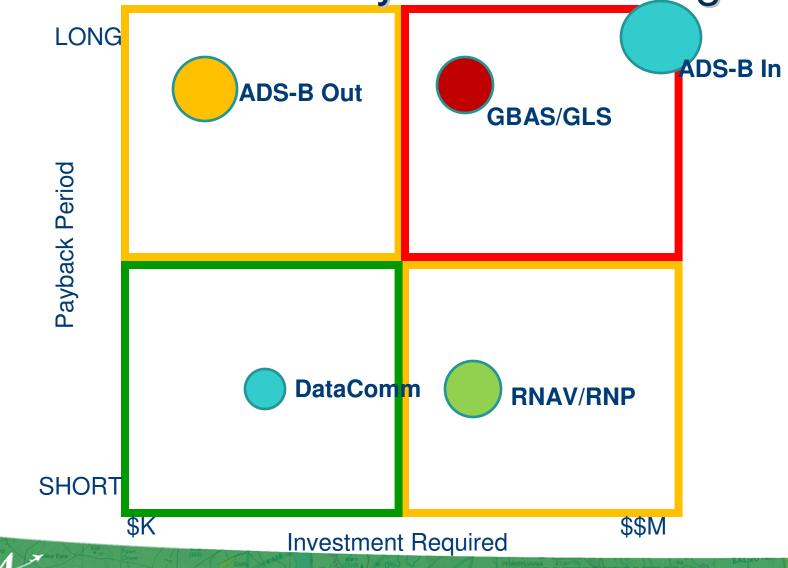


Enhancing Business Case by Bundling



RTCA

Business Case for Key NG Technologies



# The Supporting Data: A Living Knowledge Base

- Benefit/Cost/Risk Assessment Dashboard
- Detailed descriptions
- "Elements" all things required to achieve benefits

# Example Dashboard Navigation: Optimal Profile Descents

NextGei	n Dashboard - fo	r Mid-Te	rm Im	pleme	entation	(9/8/09)	For Legend See "Parameters" Sheet
Capabili (click for Descri		Timeframe	Benefit	Readiness	Implementation Risk Resolution	Consideration	Assessment Confidence
27_Non-radar GON	1EX	2012-2020	<b>H</b> ^	M^	M.	M.	Medium
28 Non-radar Low	Altitudo	2010-2019	ЦΛ	1.^	1.4	N.A.	High
29_OPD		2010-2012	M.	M^	M.	M^	Medium
ov_war noutes		2012-2013	п^	IVI	п^	IVI^	підп
32a_RNAV RNP SI	D & STAR (RNAV only)	2010-2012	H?	M^	М^	M^	Low



<< Back												
POC:	Grady Boyce											
Name:	OPD											
Benefits:	Arrival efficiency (C	OPD)										
SG1 Inputs	36,40,49,69,105,11	0,112,113,118,123										
Participants:	Frank Alexander, Sa	rah Dalton, Suzanne Porte	r, Brian Simmons, Ken Spei	r, Brian Townsend		•	•		•		•	

			E	lements Analysis:													
	Change in Roles	Technology/Equipage Required	Technology/Equipage Available?	Decision Support Tools Required		Need Procedures	Implementation Bandwidth	Need Airspace Changes	Standards Required?	Ops Approval Required	Cert Required	Political Risk	Links to Planning Documents	Training	Other Challenges	Environmental	Safety
Pilot/Operator	No role changes.	None	Yes		Designed for public use. LOAs should be addressed if OPD benefits are sought.	Yes	Yes	Yes depending on the profile developed and current airspace.	Yes with AC 90-100A	No	No	Environment al. SMS	NGIP	No			
	STAR: No. LOAs would need to be addressed to facilitate. TA: Yes. ATC will need to transmit via datalink. Training in the software would be needed as well.	None. Enhanced TMA operations would assist in spacing/merging prior to TOD	Yes	OPD operations	-	Yes		Yes depending on the profile developed and current airspace. LOAs should be addressed if OPD benefits are sought.	Yes with AC 90-100A	No		Environment al. SMS. LOAs should be addressed if OPD benefits are sought.	NGIP	No		LOAs should be addressed if OPD benefits are sought.	
Conversational N	lotes:																

Since OPD is a broad term applied to many different concepts, it is important to discuss each in their own realm: CDA Published STARs and Tailored Arrivals. It is also important to note that discussion of these also differs in the required equipage for each concept: CDA Published STARs (none needed), Tailored Arrivals (CPDLC and ATC Uplink capability). OPD, as a concept, is essentially a profile an aircraft wants to fly if left to its own accord. GE: Concerned for trajectory based operations and enabling air/ground coordination.

SG1 #40: OPD is desired, but it should be noted that each facility may not be able to implement full flight idle descents to the runway. In such cases OPD developments should be implemented where available understanding that each operational environment contains its own items to address. Saving fuel is not the only objective. Capacity and throughput should be considered.

SG1 #36: Current LOAs should be addressed as OPD is sought as a benefit.

SG1 #110: addressed via 73. UAL specifically addresses IAD and ORD.

SG1 #123: This element contains three different elements. The component referring to the FMS computing descent paths has been covered in items above. FDMS portion tabled until UPS can provide further elaboration.

SG1 #69: TBM is a nearer term capability and should be considered as part of trials. This item was moved to the Merging, Metering and spacing group.

SG1 #105: OPD

# Example Dashboard Navigation: Optimal Profile Descents

NextGen Dashboard - fo	r Mid-Te	rm Im	pleme	entation	(9/8/09)	For Legend See "Parameters" Sheet
Capability Name (click for Description)	Timeframe	Benefit	Readiness	Implementation Risk Resolution	Consideration	Assessment Confidence
27_Non-radar GOMEX	2012-2020	Н^	M^	M.	M.	Medium
28_Non-radar Low Altitude	2010-2018	НΛ	L^	L^	M.	High
29_OPD	2010-2012	M.	M^	M.	М^	Medium
30_Q&T Routes	2012-2013	Н^	M^	H^	М^	High
32a_RNAV RNP SID & STAR (RNAV only)	2010-2012	H?	M^	M^	M^	Low



# OPD Example: Overall Benefit Scores

<== Return to Top <==			Ope	rator	,			Sys	tem/	Socie	ety	Gen	eral	(Noi
Capability Name (click for Description)		<u>Benefit</u>		Capacity	Efficiency	Predictability	Operator Productivity		ANSP Productivity	Less Enviro Impact	Less Pax Delay		Access	Resource Utilization
18_En route Parallel Offsets	M.		Σ.	М.	M?	M?	?	L?	^	~^^	L?	M?	~^	L?
19_GBAS TAP	L?		L?	L?	L?	L?	?	L?	{	L?	3,	L?	L?	~^
20a_GLS	Ŧ.		ź	ź	М.	M.	?	Þ.	L?	٧.	ž.	м.	M.	?
20ab_GLS	×		ź	ź	ž	×.	?	ź	ŝ:	ų.	ź	ž	М.	?
20b_GLS	X.		¥	ź	z.	z.	?	ź	Ŀ?	ų.	ź	ž	М.	?
20c_GLS	Ξ		ŧ	ź	М.	M	?	М.	L?	2*	×	М.	М.	?
21_Integrated Arrival/Departure Airspace (aka Big Airspace)	H^		H^	H^	Н^	М?	?	H^	¥.	M?	H <sup>^</sup>	H?	~^	H?
22_LPV	H^		H^	Н^	M?	М?	?	М?	₹	M?	?	É	Н^	~^
23_MMS FDMS, Interval Management	H^		ند	j	L?	L?	?	Η^	₹*	Н^	L?	L^	2.	L?
24_MMS NT TMA RPI	~^		?	<	~^^	۸ ۲	?	~	<	~ ^	?	5	<u>۲</u>	~^
25_Metering, Merging, Spacing Utilizing Required Time of Arrival (RTA)	H^		H^	j	L?	H^	?	i	j	L?	L?	М.	, ,	М.
26_MVMC_IMC_CAS	M.		Μ.	М.	L?	H?	?	Ŋ.	₹	Μ.	?	H?	~۸	~^
27_Non-radar GOMEX	H^		H^	H^	Ħ	H^	?	M?	M?	~^	?	М.	М.	~^
28_Non-radar Low Altitude	H^		H^	10	H?	- MA	?	L?	Ľ?	~^	?	H?	M?	~
29_OPD	M.		M.	5	M.	L?	?	H?	L?	H?	M?	М.	H?	~.



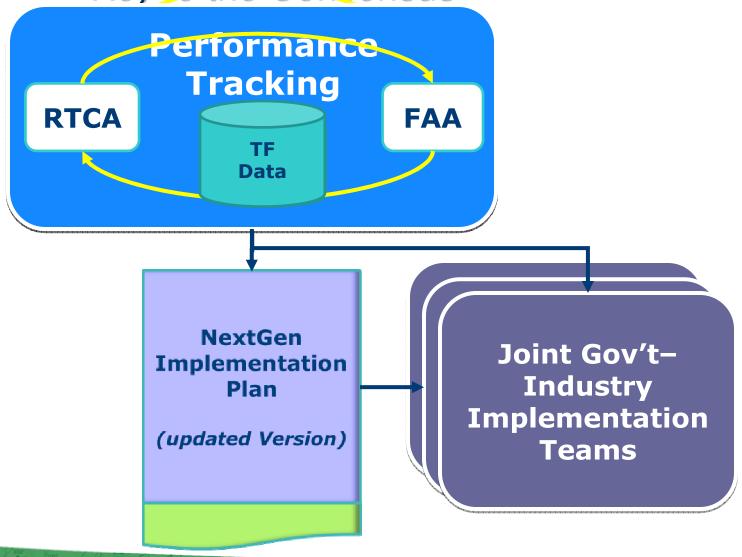
### **OPD: Detailed Assessment Comments**

3.1.2	Efficiency		
3.1.2.1	Fuel Use	M.	(-1%-3%):
lifferent :	aircraft types vary in fuel savings	from 300 - 500l	bs per flight.
mici ciic a			
	: NWA trials; MITRE analysis for		
Reference			
	: NWA trials; MITRE analysis for	PHX has also an	alyzed benefits



### Post Task Force Collaboration

Key to the Consensus



# Continued Partnership will Help Ensure All the Pieces are in Place to Achieve the Benefits of NextGen

